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EXAMINER				
JUETTNER, ANDREW MARK				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/540,436

Applicant(s)

NUBER, DIRK

Examiner

Andrew M. Juettner

Art Unit

4124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2007.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-22 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 22 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 6/22/2005, 10/02/2007
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. Cite number 3 of the information disclosure statement filed 2 October 2007 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The other citations in the information disclosure statement have been considered. Cite 3 has not been considered.

The information disclosure statement filed 22 June 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. No copy provided for the last cited abstract downloaded July 23, 2003.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 44 was used to describe the exhaust gas blower on page 17 of the specification and the blower is shown in figure 2 but not labeled. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should

include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: reference number 36 is used to designate the gas distributor however; reference number 34 is incorrectly used when describing the gas distributor on page 12, line 26 of the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Reference to Claim 1

The term "preferably" as used in claim 1 renders the claim indefinite because it fails to recite a positive limitation as to the location of the gas supply tube. It does not

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apprise one having ordinary skill in the art whether the gas supply tube must be central or not in order to satisfy the limitation in claim 1.

The term "at least partly surrounded" in claim 1 is a relative term which renders the claim indefinite. The term "at least partly surrounded" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "at least partly surrounded" does not inform one having ordinary skill in the art how far a stationary annular fluidized bed must extend around the gas supply tube in order to satisfy the limitation recited in claim 1.

In Reference to Claims 2-5

Claims 2-5 are dependent on claim 1 which is indefinite as indicated above. Therefore, claims 2-5 include all the limitations recited in claim 1 and are indefinite for the reasons state above in reference to claim 1.

In Reference to Claim 6

Claim 6 is indefinite for being dependent on claim 1 which is indefinite for the reasons stated above.

Regarding claim 6, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

The term "in particular" renders the claim 6 indefinite because it is unclear whether the limitations that the grain size of less than 0.2 mm is part of the claimed invention.

Claim 6 recites the limitation "the starting material" in lines 3 and 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 7

Claim 7 is indefinite for being dependent on claim 1 which is indefinite for the reasons stated above.

Regarding claim 7, the phrase "possibly with" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention.

In Reference to Claim 8-10

Claims 8-10 are indefinite for being dependent on claim 1 which is indefinite for the reasons stated above.

In Reference to Claim 11

Claim 11 is indefinite for being dependent on claim 1 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 11 indefinite because it is unclear whether the limitation that the solids are preheated is part of the claimed invention.

In Reference to Claim 12

Claim 12 is indefinite for being dependent on claim 1 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 12 indefinite because it is unclear whether the limitation that a separator is provided downstream of the reactor is part of the claimed invention.

The term "in particular" renders the claim 12 indefinite because it is unclear whether the limitation that the cooling system comprises an arrangement of a number of cooling stages connected to one after the other is part of the claimed invention.

Claim 12 recites the limitation "the product" in line 2 and 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 13

Claim 13 is indefinite for being dependent on claim 12 which is indefinite for the reasons stated above.

The term "in particular" renders the claim 13 indefinite because it is unclear whether the limitations that the fluidizing gas is air or that the cooling medium is water are part of the claimed invention.

Claim 13 recites the limitation "the product" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 14

Claim 14 is indefinite for being dependent on claim 12 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 14 indefinite because it is unclear whether the limitation of preheating stage is part of the claimed invention.

Claim 14 recites the limitation "the gas heated in a cooling stage" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 15

The term "at least partly surrounded" in claim 15 is a relative term which renders the claim indefinite. The term "at least partly surrounded" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "at least partly surrounded" does not inform one having ordinary skill in the art how far a stationary annular fluidized bed must extend around the gas supply system in order to satisfy the limitation recited in claim 15.

In Reference to Claim 16

Claim 16 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

The term "substantially vertically" in claim 16 is a relative term which renders the claim indefinite. The term "substantially vertically" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Substantially vertically does not inform one having ordinary skill in the art how much off of vertical the gas supply tube can extend upwards to satisfy the recited limitation.

The term "at least partly around" in claim 16 is a relative term which renders the claim indefinite. The term "at least partly around" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "at least partly around" does not inform one having ordinary skill in

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the art how far a chamber must extend around the gas supply tube in order to satisfy the limitation recited in claim 16.

In Reference to Claim 17

Claim 17 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

Claim 17 recites the limitation "the gas supply tube" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Only a gas supply system was recited in claim 15 from which claim 17 depends.

In Reference to Claim 18

Claim 18 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 18 indefinite because it is unclear whether the limitation of a solids conduct leading to the cooling system is part of the claimed invention.

In Reference to Claim 19

Claim 19 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

In Reference to Claim 20

Claim 20 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

Claim 20 recites the limitation "the annular chamber" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 20 depends from claim 15 which only recites an annular fluidized bed.

In Reference to Claim 21

Claim 21 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 21 indefinite because it is unclear whether the limitation of heated gas is part of the claimed invention.

Claim 21 recites the limitation "the gas supply tube" in line 3 and 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. Only a gas supply system was recited in claim 15 from which claim 21 depends.

In Reference to Claim 22

Claim 22 is indefinite for being dependent on claim 15 which is indefinite for the reasons stated above.

The term "and/or" renders the claim 22 indefinite because it is unclear whether the limitations of indirect cooling stages or fluidized bed coolers are part of the claimed invention.

The term "in particular" renders the claim 22 indefinite because it is unclear whether the limitations that the cooling stages are cooling cyclones or fluidized bed coolers are part of the claimed invention.

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by US Application Publication 2007/0137435 to Orth et al. (Orth).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In Reference to Claim 1

Orth teaches:

A method for the heat treatment of fine-grained solids (page 1, paragraph 0001), in particular gypsum, in which the solids are heated to a temperature of 50 to 1000°C in a fluidized bed reactor, wherein a first gas or gas mixture is introduced from below through a preferably central gas supply tube into a mixing chamber of

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the reactor (see fig. 2; page 5, paragraph 0057, lines 6-9), the gas supply tube being at least partly surrounded by a stationary annular fluidized bed (see fig. 2; fluidized bed 12 surrounds tube 9) which is fluidized by supplying fluidizing gas (page 4, paragraph 0045, lines 1-4), and in that the gas velocities of the first gas or gas mixture as well as of the fluidizing gas for the annular fluidized bed are adjusted such that the particle Froude numbers in the gas supply tube are between 1 and 100, in the annular fluidized bed between 0.02 and 2 and in the mixing chamber between 0.3 and 30 (abstract; page 1, paragraph 0005, lines 8-13).

As indicated above, claim 1 is indefinite. For the purposes of compact prosecution hereinafter "preferably central" is being interpreted as central and "at least partly surrounded" is being interpreted as extending around more than a third of the circumference.

In Reference to Claim 2

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein the particle Froude number in the gas supply tube is between 1.15 and 20 (Page 1, paragraph 0007, lines 3-6).

In Reference to Claim 3

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein the particle Froude number in the annular fluidized bed is between 0.115 and 1.15 (Page 1, paragraph 0007, lines 3-7).

In Reference to Claim 4

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein that the particle Froude number in the mixing chamber is between 0.37 and 3.7 (Page 1, paragraph 0007, lines 3-7).

In Reference to Claim 5

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein the bed height of the solids in the reactor is adjusted such that the annular fluidized bed extends beyond the upper orifice end of the gas supply tube (page 2, paragraph 0014, lines 2-5; page 4, paragraph 0044, lines 7-6), and that solids are constantly introduced into the first gas or gas mixture and entrained by the gas stream to the mixing chamber located above the orifice region of the gas supply tube (page 2, paragraph 0014, lines 5-8).

In Reference to Claim 6

Orth teaches:

The method as claimed in claim 1, wherein fine-grained solids, for example moist gypsum, with a grain size of less than 2 mm (page 2, paragraph 0013, lines 7-9), in particular less than 0.2 mm, are supplied as the starting material.

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As indicated above, claim 6 is indefinite for the use of “for example” and “in particular” in the recitation. For the purposes of compact prosecution “for example moist gypsum” and “in particular less than 0.2 mm” are not being treated as positive recitations of limitations.

In Reference to Claim 7

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein hot gas, which is generated in an upstream combustion chamber by burning supplied fuel, possibly with the admixture of a gas containing oxygen, is supplied to the reactor via the gas supply tube (page 2, paragraph 0021, lines 4-8).

As indicated above, claim 7 is indefinite for the use of “possibly” in the recitation. For the purposes of compact prosecution the recitation of “possibly with the admixture of a gas containing oxygen” is not being treated as a positive recitation of a limitation in the claim.

In Reference to Claim 8

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein the solids are heated in the reactor to a temperature of 150 to 1000°C (abstract, overlapping range 750 to 1150°C).

In Reference to Claim 9

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein air is supplied to the reactor as fluidizing gas (page 4, paragraph 0045, lines 1-4).

In Reference to Claim 10

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein the pressure in the reactor is between 0.8 and 10 bar (page 2, paragraph 0022).

In Reference to Claim 11

Orth teaches:

The method as claimed in claim 1 (see rejection of claim 1 above), wherein, before the heat treatment in the reactor, the solids are suspended, dried and/or pre-heated in at least one pre-heating stage (page 4, paragraph 0042), comprising a heat exchanger (2) and a downstream separator (3).

As indicated above, claim 11 is indefinite because of the use of "and/or" in the recitation.

For the purposes of compact prosecution "and/or" is being interpreted as or.

8. Claims 15-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,505,907 to Hiltunen et al. (Hiltunen).

In Reference to Claim 15

Hiltunen teaches:

A plant for the heat treatment of fine-grained solids, in particular for performing a method as claimed in claim 1 comprising a reactor (10) constituting a fluidized bed reactor (10 has fluidized bed 14) for the heat treatment, wherein the reactor has a gas supply system (inlet duct or conduit 16) which is formed such that gas

flowing through the gas supply system entrains solids from a stationary annular fluidized bed (column 4, lines 40-44), which at least partly surrounds the gas supply system (see figs. 1-4), into the mixing chamber (column 4, lines 46-47). As indicated above, claim 15 is indefinite. For the purposes of compact prosecution "at least partly surrounded" is being interpreted as extending around more than a third of the circumference.

In Reference to Claim 16

Hiltunen teaches:

The plant as claimed in claim 15 (see rejection of claim 15 above), wherein the gas supply system has a gas supply tube extending upwards substantially vertically from the lower region of the reactor into the mixing chamber of the reactor (16 extends into section 22), the gas supply tube being surrounded by a chamber which extends at least partly around the gas supply tube and in which a stationary annular fluidized bed is formed (chamber 12 surrounds 16 and contains fluidized bed 14).

As indicated above, claim 16 is indefinite. For the purposes of compact prosecution "at least partly around" is being interpreted as extending around more than a third of the circumference.

In Reference to Claim 17

Hiltunen teaches:

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The plant as claimed in claim 15 (see rejection of claim 15 above), wherein the gas supply tube is arranged approximately centrally with reference to the cross-sectional area of the reactor (see figs. 1-4; column 4, line 4-5).

In Reference to Claim 18

Hiltunen teaches:

The plant as claimed in claim 15 (see rejection of claim 15 above), wherein a separator (28) is provided downstream of the reactor, for the separation of solids, and that the separator has a solids conduit (36) leading to the annular fluidized bed of the reactor (12) and/or a solids conduit (36) leading to the cooling system (duct 36 leads to heat exchangers 44).

As indicated above, claim 18 is indefinite. For the purposes of compact prosecution "and/or" is being interpreted as or in claim 18.

In Reference to Claim 20

Hiltunen teaches:

The plant as claimed in claim 15 (see rejection of claim 15 above), wherein provided in the annular chamber of the reactor is a gas distributor (52) which divides the chamber into an upper annular fluidized bed and a lower gas distributor(see figs. 1-4), and that the gas distributor is connected to a supply conduit for fluidizing gas (see figs. 1-3, arrow indicates the flow of the fluidizing gas).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of US Patent 6,015,539 to Schmidt et al. (Schmidt).

In Reference to Claim 12

Orth discloses the method as claimed in claim 1 (see rejection of claim 1 above), but does not disclose wherein, after the heat treatment in the reactor, the product from the annular fluidized bed of the reactor and/or a separator provided downstream of the reactor is at least partly supplied to a cooling system, which comprises in particular an arrangement of a number of cooling stages connected one after the other.

Schmidt teaches:

After the heat treatment in the reactor, the product from the annular fluidized bed of the reactor and/or a separator provided downstream of the reactor is at least partly supplied to a cooling system (column 4, lines 22-43), which comprises in particular an arrangement of a number of cooling stages connected one after the other (see figure; suspension coolers 16, 18, 20 and fluidized bed cooler 23).

It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute the cooling of the product in the cooling system as taught by Schmidt for the reduction reactor of Orth in order to lower the temperature of the product while being able to more easily adapt for the amount of fluidized air required as taught by Schmidt (column 3, lines 18-22).

As indicated above, claim 12 is indefinite because of the use of "and/or", "in particular" and "the product" in the recitation. For the purposes of compact prosecution "and/or" is being interpreted as or. Also, the interpretation of claim 12 will include "an arrangement of a number of cooling stages connected one after the other" as positive recitation of limitation as to the composition of the cooling system. "The product" is being interpreted to be the solids that have been calcined hereinafter.

In Reference to Claim 13

Orth as modified by Schmidt teaches:

The method as claimed in claim 12 (see rejection above), wherein the product forms in a cooling stage at least one fluidized bed (23), in which it is cooled by a fluidizing gas (column 4, lines 37-41), in particular air, and/or a cooling coil

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formed in the fluidized bed, with cooling medium, in particular water (column 4, lines 41-43).

As indicated above, claim 13 is indefinite for its use of "in particular." For the purposes of compact prosecution neither the fluidizing gas being air nor the cooling medium being water are being treated as positive recitations in the claim.

In Reference to Claim 14

Orth as modified by Schmidt teaches:

The method as claimed in claim 12 (see rejection of claim 12 above) wherein the gas heated in a cooling stage (suspension coolers 16,18,20 and fluidized bed cooler 23) is supplied to an upstream cooling stage (column 5, lines 15-18; see figure line from 23 to 20), the reactor (column 5, lines 13-15,24-27; see figure lines 10 and 11), the combustion chamber and/or a pre-heating stage.

As indicated above, claim 14 is indefinite because of the use of "and/or" in the recitation.

For the purposes of compact prosecution "and/or" is being interpreted as or.

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiltumen in view of US Patent 3,884,620 to Rammler (Rammler).

Hiltumen teaches the plant as claimed in claim 15 (see rejection of claim 15 above), but does not disclose wherein provided upstream of the reactor is a combustion chamber with supply conduits for fuel, oxygen and/or heated gas, the exhaust gas of which is passed into the gas supply tube. Hiltumen does disclose that hot gas 48 is introduced through inlet duct 16 (column 4, lines 39-41).

Rammler teaches a fluidized bed reactor system (see fig. 1) wherein provided upstream of the reactor is a combustion chamber (12) with supply conduits for fuel, oxygen and/or heated gas (see fig. 1; column 5, lines 14-21 describing combustion chamber 12 as like combustion chamber 5 described at column 4, lines 40-48), the exhaust gas of which is passed into the gas supply tube (column 5, lines 14-15).

It would have been obvious to one having ordinary skill in the art at the time of the invention to add the combustion chamber of Rammler to the fluidized bed reactor of Hiltumen in order to produce the desired hot gas flow to be utilized in the Hiltumen reactor.

As indicated above, claim 21 is indefinite. For the purposes of compact prosecution "and/or" is being treated as or for claim 21.

13. Claims 19 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Hiltumen in view of US Patent 3,995,987 to MacAskill (MacAskill).

In Reference to Claim 19

Hiltumen teaches the plant as claimed in claim 15 (see rejection of claim 15 above), but does not disclose wherein a solids conduit leading from the annular fluidized bed of the reactor to the cooling system is provided.

MacAskill teaches a calcining plant (see figure) wherein a solids conduit (22) leading from the annular fluidized bed of the reactor (2) to the cooling system (3) is provided.

It would have been obvious to one having ordinary skill in the art at the time of the invention to add the solids conduit leading to a cooling system of MacAskill to the

fluidized bed reactor of Hiltumen in order to remove/recover more heat from the particles discharged from the fluidized bed through conduit 56.

In Reference to Claim 22

Hiltumen teaches the plant as claimed in claim 15 (see rejection of claim 15 above), but does not disclose wherein provided downstream of the reactor is a cooling system, comprising direct and/or indirect cooling stages, in particular cooling cyclones and/or fluidized bed coolers.

MacAskill teaches a calcining plant (see figure) wherein provided downstream of the reactor is a cooling system (fluidized bed heat exchanger 3, cyclone separators 6, 6', 7), comprising direct (fluidized bed heat exchanger 3 uses cooler air introduced through 30 to cool and fluidize) and/or indirect (reactor air introduced through 32 receives heat from particles before being used as fluidizing gas for reactors) cooling stages, in particular cooling cyclones (6,6',7) and/or fluidized bed coolers (3).

It would have been obvious to one having ordinary skill in the art at the time of the invention to add the cooling system of MacAskill to the fluidized bed reactor of Hiltumen in order to remove/recover heat from the fluidized bed particles discharged from the fluidized bed reactor.

As indicated above, claim 22 is indefinite. For the purposes of compact prosecution "and/or" is being treated as or for claim 22. Also, claim 22 is being interpreted to include the cooling cyclones or fluidized bed coolers as a positive recitation of a limitation in the claim.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Orth 0278566 discloses a fluidized bed reactor with central gas supply tube and Froude numbers in the desired ranges. Hirsch 0263292 discloses a fluidized bed reactor with a central gas supply tube and Froude numbers in the desired ranges. Reh '408 discloses a fluidized bed furnace with downstream cooling stages comprising fluidized bed coolers and a cyclone. Reh '085 discloses a fluidized bed calcining reactor with attached separator, independent heating device, and downstream fluidized bed heat exchanger. Hundebol discloses a calciner plant where exhaust gas is used in pre-heaters. Li discloses a stages particulate cooling system with fluidized bed coolers and cyclone separators. Kroehl discloses a method of calcining moist gypsum with fluidized bed reactors and fluidized bed coolers. Bresser discloses a process for calcining fine-grained particles using a fluidized bed. Roetheli discloses a fluidized reactor with heated gas input from an upstream combustor. Freytag discloses a method of transporting fine-grained particles and a reactor with Froude numbers in the range claimed. Stroder discloses a fluidized bed reactor with central gas supply tube and a downstream fluidized bed cooler. Nuber discloses a fluidized bed reactor with central supply tube with downstream fluidized bed coolers. Hirsch '580 discloses a method for calcining fine-grained solids.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew M. Juettner whose telephone number is (571)

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270-5053. The examiner can normally be reached on Monday through Friday 7:30am to 5pm Est..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Bomberg can be reached on (571) 272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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AMJ

/A. M. J./

/Thor S. Campbell/

Primary Examiner, Art Unit 3742